

What is claimed is:

1. A distortion compensation apparatus which compensates for a distortion characteristic of an amplifier, comprising:
5

an adjacent channel leakage power extraction unit extracting at least adjacent channel leakage power of a main channel signal to be processed in a distortion compensating process from an output
10 signal of the amplifier;

a distortion compensation coefficient computation unit converting an amplitude value and a phase value of a distortion compensation coefficient into respective gene types, and
15 obtaining the distortion compensation coefficient based on a genetic algorithm using the adjacent channel leakage power value or the adjacent channel leakage power ratio obtained from the adjacent channel leakage power value as an evaluation
20 function; and

a distortion compensation coefficient application unit applying the distortion compensation coefficient computed by said distortion compensation coefficient computation
25 unit as an input signal of the amplifier.

2. The apparatus according to claim 1, wherein
said gene type is generated for each of a
power value of an input signal of the amplifier, an
amplitude value, a function of the power value, or
5 a value distinguished by a function value of the
amplitude value.
3. The apparatus according to claim 1, wherein
10 said gene type is given as a series
represented by binary values indicating an
amplitude and a phase value of the distortion
compensation coefficient.
- 15 4. The apparatus according to claim 1, wherein
said distortion compensation coefficient
computation unit sequentially computes a distortion
compensation coefficient from a largest value to a
smallest value of a power value of an input signal
20 to the amplifier.
5. The apparatus according to claim 1, wherein
said distortion compensation coefficient
computation unit computes all distortion
25 compensation coefficients, and then repeats

sequentially updating distortion compensation coefficients from a largest power value to a smallest power value of an input signal to the amplifier.

5

6. The apparatus according to claim 4, wherein
said distortion compensation coefficient
computation unit uses a gene type corresponding to
a larger power value already obtained as an initial
10 value of a gene type corresponding to the power
value of the input signal, or a similar gene type.

7. The apparatus according to claim 2, wherein
said distortion compensation coefficient
15 computation unit sets a value for discrimination of
the gene type as discrete values of a power value
of the input signal, obtains a distortion
compensation coefficient corresponding to the
discrete values, and obtains a distortion
20 compensation coefficient in an interpolating
process for a power value between the discrete
values.

8. The apparatus according to claim 1, wherein
25 said distortion compensation coefficient

computation unit obtains a distortion compensation coefficient corresponding to a power value of the input signal larger than a predetermined value using a genetic algorithm, and obtains a distortion compensation coefficient corresponding to a power value of the input signal smaller than the predetermined value in a method other than the genetic algorithm.

10 9. The apparatus according to claim 8, wherein said method other than the genetic algorithm uses the power value of the input signal as is.

15 10. The apparatus according to claim 8, wherein said method other than the genetic algorithm performs an interpolating process on the power value of the input signal.

20 11. The apparatus according to claim 1, wherein said distortion compensation coefficient application unit provides an amplitude value of the distortion compensation coefficient through a gain adjuster, and a phase value through a phase shifter for an input signal of the amplifier.

12. The apparatus according to claim 1, wherein
said distortion compensation coefficient
application unit complex-multiplies an input signal
of the amplifier by the distortion compensation
5 coefficient.

13. The apparatus according to claim 1, wherein
said distortion compensation coefficient
application unit obtains the distortion
10 compensation coefficient as a complex difference
signal between an input signal to the amplifier and
a signal obtained after distortion compensation,
and performs a distortion compensating process on
the input signal by increasing/decreasing an
15 original input signal using the difference signal.

14. The apparatus according to claim 1, wherein
said adjacent channel leakage power extraction
unit demodulates output of the amplifier, performs
20 a Fourier transform on the demodulated output, and
obtains an adjacent channel leakage power value or
an adjacent channel leakage power ratio.

15. The apparatus according to claim 1, wherein
25 said adjacent channel leakage power extraction

unit demodulates output of the amplifier, and obtains an adjacent channel leakage power value or an adjacent channel leakage power ratio from the demodulated output using a digital filter.

5

16. The apparatus according to claim 1, wherein said adjacent channel leakage power extraction unit passes output of the amplifier through a band pass filter, and obtains a detection result through a power detector, thereby obtaining an adjacent channel leakage power value or an adjacent channel leakage power ratio.

10

17. The apparatus according to claim 1, wherein said adjacent channel leakage power extraction unit varies a crossover rate of the genetic algorithm according to adaptability of the gene type.

15

18. The apparatus according to claim 1, wherein said adjacent channel leakage power extraction unit varies a mutation rate of the genetic algorithm according to adaptability of the gene type.

20

25

19. The apparatus according to claim 1, wherein
said adjacent channel leakage power extraction
unit varies a frequency of succeeding generations
of the genetic algorithm according to adaptability
5 of the gene type.

20. A distortion compensating method for
compensating for a distortion characteristic of an
amplifier, comprising:

10 extracting at least adjacent channel leakage
power of a main channel signal to be processed in a
distortion compensating process from an output
signal of the amplifier;

converting an amplitude value and a phase
15 value of a distortion compensation coefficient into
respective gene types, and obtaining the distortion
compensation coefficient based on a genetic
algorithm using the adjacent channel leakage power
value or the adjacent channel leakage power ratio
20 obtained from the adjacent channel leakage power
value as an evaluation function; and

applying the distortion compensation
coefficient computed in said distortion
compensation coefficient computing step as an input
25 signal of the amplifier.